

**Records of drilling and well completion
for work performed in 2008 by the
Geological Survey Program,
Department of Environment and Natural Resources,
in the area of the proposed Hyperion Energy Center**

Location Information

Legal Location:NE NW SW NE SEC. 30, T. 092 N., R. 49 W.
County:UNION Location:092N-49W-30ACBA
Basin:BIG SIOUX Latitude:42 45' 42"
Hydrologic Unit Code:10170203 Longitude: 96 40' 23"
Land Owner: Ground Surface Elevation (ft.):1132.97 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:09/03/2008 Geologist's Log:X
Company:SDGS Driller:D. IVERSON
Drilling Method:AUGER Driller's Log:
Test Hole Number:R20-2008-04 Total Drill Hole Depth (ft.):30.0
Samples:

Well Information

SDGS Well Name: R20-2008-04 Aquifer:ALLUVIUM
Water Rights Well: Management Unit:
Other Well Name: Casing Top Elevation:1134.97 I
Casing Type:PVC, SCH. 80 Casing Diameter (in.):2.0
Screen Type:PVC, SCH. 80, 0.01 IN. SLOT Screen Length (ft.):10.0
Total Casing and Screen (ft.):31.0 Casing Stick-up (ft.):2.00
Well Maintenance Date:

Geophysical Information

Spontaneous Potential: Single Point Resistivity:
Natural Gamma: Extra:

SCREEN INTERVAL 29 FEET TO 19 FEET BELOW LAND SURFACE; FILTER PACK (MEDIUM QUARTZ SAND) FROM 30 FEET TO 10 FEET BELOW LAND SURFACE; BENTONITE GROUT FROM 10 FEET TO 3 FEET BELOW LAND SURFACE; CEMENT GROUT FROM 3 FEET BELOW LAND SURFACE TO LAND SURFACE; LOCKING STEEL WELL PROTECTOR INSTALLED.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1132.97 - 1130.97	0.0 - 2.0	TOPSOIL, BROWN, SILTY
1130.97 - 1122.97	2.0 - 10.0	CLAY, BLACK, SILTY
1122.97 - 1102.97	10.0 - 30.0	SAND AND GRAVEL, FINE SAND TO FINE GRAVEL

* * * *

Location Information

Legal Location:NW NW NW NE SEC. 02, T. 092 N., R. 50 W.

County:UNION

Location:092N-50W-02ABBB

Basin:BIG SIOUX

Latitude:42 49' 19"

Hydrologic Unit Code:10170203

Longitude: 96 43' 03"

Land Owner:

Ground Surface Elevation (ft.):1225 T

Project Information

Project:STATEWIDE MONITORING

Geologist:M. NOONAN

Drill Date:08/18/2008

Geologist's Log:X

Company:SDGS

Driller:S. JENSEN

Drilling Method:ROTARY

Driller's Log:

Test Hole Number:R2-2008-26

Total Drill Hole Depth (ft.):102.0

Samples:

Geophysical Information

Spontaneous Potential:X

Single Point Resistivity:X

Natural Gamma:X

Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 102 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1225.00 - 1223.00	0.0 - 2.0	TOPSOIL, BLACK, SILTY
1223.00 - 1199.00	2.0 - 26.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1199.00 - 1135.00	26.0 - 90.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1135.00 - 1123.00	90.0 - 102.0	SHALE, GRAY (CARLILE SHALE)
		* * * *

Location Information

Legal Location:SE SE NW NE SEC. 02, T. 092 N., R. 50 W.
County:UNION Location:092N-50W-02ABDD
Basin:BIG SIOUX Latitude:42 49' 07"
Hydrologic Unit Code:10170203 Longitude: 96 42' 46"
Land Owner: Ground Surface Elevation (ft.):1222 T

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/18/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-25 Total Drill Hole Depth (ft.):82.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 82 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1222.00 - 1214.00	0.0 - 8.0	TOPSOIL, BLACK, SILTY
1214.00 - 1209.00	8.0 - 13.0	CLAY, TAN, SILTY (TILL)
1209.00 - 1207.00	13.0 - 15.0	CHALK, WHITE (CHALK BLOCK)
1207.00 - 1204.00	15.0 - 18.0	CLAY, YELLOW, SILTY (TILL)
1204.00 - 1202.00	18.0 - 20.0	CLAY, GRAY (TILL)
1202.00 - 1195.00	20.0 - 27.0	CLAY, BROWN, SILTY (TILL)
1195.00 - 1170.00	27.0 - 52.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1170.00 - 1140.00	52.0 - 82.0	SHALE, DARK-GRAY (CARLILE SHALE)

* * * *

Location Information

Legal Location:NW NE SE NE SEC. 02, T. 092 N., R. 50 W.

County:UNION

Location:092N-50W-02ADAB

Basin:BIG SIOUX

Latitude:42 49' 07"

Hydrologic Unit Code:10170203

Longitude: 96 42' 33"

Land Owner:

Ground Surface Elevation (ft.):1222 T

Project Information

Project:STATEWIDE MONITORING

Geologist:M. NOONAN

Drill Date:08/04/2008

Geologist's Log:X

Company:SDGS

Driller:S. JENSEN

Drilling Method:ROTARY

Driller's Log:

Test Hole Number:R2-2008-19

Total Drill Hole Depth (ft.):142.0

Samples:

Geophysical Information

Spontaneous Potential:X

Single Point Resistivity:X

Natural Gamma:X

Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 142 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1222.00 - 1220.00	0.0 - 2.0	TOPSOIL, BROWN
1220.00 - 1195.00	2.0 - 27.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1195.00 - 1185.00	27.0 - 37.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1185.00 - 1114.00	37.0 - 108.0	SHALE, DARK-GRAY (CARLILE SHALE)
1114.00 - 1090.00	108.0 - 132.0	LIMESTONE; INTERBEDDED LAYERS OF GRAY-BROWN CLAY (GREENHORN LIMESTONE)
1090.00 - 1080.00	132.0 - 142.0	SHALE, DARK-GRAY (GRANEROS SHALE)

* * * *

Location Information

Legal Location:SW SW NW NW SEC. 04, T. 092 N., R. 50 W.
County:UNION Location:092N-50W-04BBCC 1
Basin:BIG SIOUX Latitude:42 49' 03"
Hydrologic Unit Code:10170203 Longitude: 96 46' 01"
Land Owner: Ground Surface Elevation (ft.):1236 T

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:07/30/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-17 Total Drill Hole Depth (ft.):245.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 245 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1236.00 - 1234.00	0.0 - 2.0	ROADFILL
1234.00 - 1226.00	2.0 - 10.0	CLAY, RED-BROWN, SILTY, SANDY, PEBBLY
1226.00 - 1205.00	10.0 - 31.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1205.00 - 1141.00	31.0 - 95.0	CLAY, GRAY, SILTY, SANDY, PEBBLY (TILL)
1141.00 - 1131.00	95.0 - 105.0	GRAVEL, FINE; INTERBEDDED LAYERS OF FINE TO COARSE SAND
1131.00 - 1119.00	105.0 - 117.0	CLAY, GRAY, SILTY, SANDY, PEBBLY (TILL)
1119.00 - 1056.00	117.0 - 180.0	SAND AND GRAVEL, FINE SAND TO FINE PEBBLE GRAVEL
1056.00 - 991.00	180.0 - 245.0	GRAVEL, FINE TO COARSE; INTERBEDDED LAYERS OF FINE TO COARSE SAND

* * * *

Location Information

Legal Location:NW NE NW NE SEC. 05, T. 092 N., R. 50 W.

County:UNION

Location:092N-50W-05ABAB

Basin:BIG SIOUX

Latitude:42 49' 20"

Hydrologic Unit Code:10170203

Longitude: 96 46' 23"

Land Owner:

Ground Surface Elevation (ft.):1234 T

Project Information

Project:STATEWIDE MONITORING

Geologist:M. NOONAN

Drill Date:07/22/2008

Geologist's Log:X

Company:SDGS

Driller:S. JENSEN

Drilling Method:ROTARY

Driller's Log:

Test Hole Number:R2-2008-15

Total Drill Hole Depth (ft.):245.0

Samples:

Geophysical Information

Spontaneous Potential:X

Single Point Resistivity:X

Natural Gamma:X

Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 245 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1234.00 - 1231.00	0.0 - 3.0	TOPSOIL, BLACK
1231.00 - 1212.00	3.0 - 22.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1212.00 - 1167.00	22.0 - 67.0	CLAY, GRAY, SILTY, SANDY, PEBBLY (TILL)
1167.00 - 1157.00	67.0 - 77.0	CHALK, WHITE (CHALK BLOCK)
1157.00 - 1112.00	77.0 - 122.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1112.00 - 1031.00	122.0 - 203.0	SAND AND GRAVEL, FINE SAND TO FINE PEBBLE GRAVEL
1031.00 - 1027.00	203.0 - 207.0	GRAVEL, COARSE
1027.00 - 989.00	207.0 - 245.0	GRAVEL, FINE TO COARSE; INTERBEDDED LAYERS OF FINE TO COARSE SAND

* * * *

Location Information

Legal Location:SE SE SW SE SEC. 12, T. 092 N., R. 50 W.
County:UNION Location:092N-50W-12DCDD
Basin:BIG SIOUX Latitude:42 47' 38"
Hydrologic Unit Code:10170203 Longitude: 96 41' 38"
Land Owner: Ground Surface Elevation (ft.):1199 T

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/05/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-21 Total Drill Hole Depth (ft.):62.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 62 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1199.00 - 1197.00	0.0 - 2.0	TOPSOIL, BLACK
1197.00 - 1172.00	2.0 - 27.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1172.00 - 1151.00	27.0 - 48.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1151.00 - 1144.00	48.0 - 55.0	GRAVEL, FINE TO COARSE; INTERMITTENT LAYERS OF FINE TO COARSE SAND
1144.00 - 1137.00	55.0 - 62.0	SHALE, DARK-GRAY (CARLILE SHALE)

* * * *

Location Information

Legal Location:SW NW NW NW SEC. 14, T. 092 N., R. 50 W.
County:UNION Location:092N-50W-14BBBC
Basin:BIG SIOUX Latitude:46 47' 31"
Hydrologic Unit Code:10170203 Longitude: 96 43' 37"
Land Owner: Ground Surface Elevation (ft.):1226.12 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:07/31/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-18 Total Drill Hole Depth (ft.):162.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 162 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1226.12 - 1224.12	0.0 - 2.0	TOPSOIL, BLACK
1224.12 - 1207.12	2.0 - 19.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1207.12 - 1129.12	19.0 - 97.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1129.12 - 1064.12	97.0 - 162.0	SAND AND GRAVEL, FINE SAND TO FINE PEBBLE GRAVEL

* * * *

Location Information

Legal Location:SW NW NW NW SEC. 14, T. 092 N., R. 50 W.
County:UNION Location:092N-50W-14BBBC 1
Basin:BIG SIOUX Latitude:42 47' 30"
Hydrologic Unit Code:10170203 Longitude: 96 43' 39"
Land Owner: Ground Surface Elevation (ft.):1226.12 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/13/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-24 Total Drill Hole Depth (ft.):116.0
Samples:

Well Information

SDGS Well Name: R2-2008-24 Aquifer:LOWER-VERMILLION-MISSOURI
Water Rights Well: Management Unit:
Other Well Name: Casing Top Elevation:1228.12 I
Casing Type:PVC, SCH. 80 Casing Diameter (in.):2.0
Screen Type:PVC, SCH. 80, 0.01 IN. SLOT Screen Length (ft.):10.0
Total Casing and Screen (ft.):116.3 Casing Stick-up (ft.):2.00
Well Maintenance Date:

Geophysical Information

Spontaneous Potential: Single Point Resistivity:
Natural Gamma: Extra:

SCREEN INTERVAL FROM 114.3 FEET TO 104.3 FEET BELOW LAND SURFACE; FILTER PACK
(MEDIUM QUARTZ SAND) FROM 114.3 FEET TO 98 FEET BELOW LAND SURFACE; BENTONITE GROUT
FROM 98 FEET TO 4 FEET BELOW LAND SURFACE; CEMENT GROUT FROM 4 FEET BELOW LAND
SURFACE TO LAND SURFACE; LOCKING STEEL WELL PROTECTOR INSTALLED.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1226.12 - 1224.12	0.0 - 2.0	ROADFILL
1224.12 - 1207.12	2.0 - 19.0	CLAY, TAN, SILTY, SANDY, PEBBLY (TILL)
1207.12 - 1128.12	19.0 - 98.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1128.12 - 1110.12	98.0 - 116.0	SAND AND GRAVEL, COARSE SAND TO MEDIUM GRAVEL

* * * *

Location Information

Legal Location:NE NE NE NE SEC. 24, T. 092 N., R. 50 W.
County:UNION Location:092N-50W-24AAAA 1
Basin:BIG SIOUX Latitude:42 46' 45"
Hydrologic Unit Code:10170203 Longitude: 96 41' 18"
Land Owner: Ground Surface Elevation (ft.):1164.41 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/11/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-22 Total Drill Hole Depth (ft.):60.0
Samples:

Well Information

SDGS Well Name: R2-2008-22 Aquifer:MISSOURI
Water Rights Well: Management Unit:ELK POINT
Other Well Name: Casing Top Elevation:1166.41 I
Casing Type:PVC, SCH. 80 Casing Diameter (in.):2.0
Screen Type:PVC, SCH. 80, 0.01 IN. SLOT Screen Length (ft.):10.0
Total Casing and Screen (ft.):51.9 Casing Stick-up (ft.):2.00
Well Maintenance Date:

Geophysical Information

Spontaneous Potential: Single Point Resistivity:
Natural Gamma: Extra:

SCREEN INTERVAL FROM 49.9 TO 39.9 FEET BELOW LAND SURFACE; FILTER PACK (MEDIUM QUARTZ SAND) FROM 49.9 TO 38 FEET BELOW LAND SURFACE; BENTONITE GROUT FROM 38 FEET TO 5 FEET BELOW LAND SURFACE; CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE; LOCKING STEEL WELL PROTECTOR INSTALLED.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1164.41 - 1161.41	0.0 - 3.0	TOPSOIL, BLACK
1161.41 - 1145.41	3.0 - 19.0	CLAY, TAN, SILTY, SANDY, PEBBLY (TILL)
1145.41 - 1132.41	19.0 - 32.0	SAND AND GRAVEL, FINE SAND TO MEDIUM GRAVEL
1132.41 - 1108.41	32.0 - 56.0	GRAVEL, FINE TO COARSE; INTERBEDDED LAYERS OF FINE TO COARSE SAND
1108.41 - 1104.41	56.0 - 60.0	CLAY, BLACK, SILTY

* * * *

Location Information

Legal Location:NE SE NE SE SEC. 21, T. 093 N., R. 50 W.
County:UNION Location:093N-50W-21DADA
Basin:BIG SIOUX Latitude:42 51' 25"
Hydrologic Unit Code:10170203 Longitude: 96 44' 39"
Land Owner: Ground Surface Elevation (ft.):1208.01 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/04/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-20 Total Drill Hole Depth (ft.):82.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 82 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1208.01 - 1206.01	0.0 - 2.0	TOPSOIL, BLACK
1206.01 - 1198.01	2.0 - 10.0	CLAY, BLACK, VERY SILTY
1198.01 - 1188.01	10.0 - 20.0	SAND AND GRAVEL, FINE SAND TO COARSE GRAVEL
1188.01 - 1157.01	20.0 - 51.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1157.01 - 1139.01	51.0 - 69.0	SHALE, GRAY (CARLILE SHALE)
1139.01 - 1126.01	69.0 - 82.0	LIMESTONE; INTERBEDDED LAYERS OF GRAY-BROWN CLAY (GREENHORN LIMESTONE)

* * * *

Location Information

Legal Location:NE SE NE SE SEC. 21, T. 093 N., R. 50 W.
County:UNION Location:093N-50W-21DADA 1
Basin:BIG SIOUX Latitude:42 51' 25"
Hydrologic Unit Code:10170203 Longitude: 96 44' 49"
Land Owner: Ground Surface Elevation (ft.):1208.01 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:09/02/2008 Geologist's Log:X
Company:SDGS Driller:D. IVERSON
Drilling Method:AUGER Driller's Log:
Test Hole Number:R20-2008-03 Total Drill Hole Depth (ft.):20.0
Samples:

Well Information

SDGS Well Name: R20-2008-03 Aquifer:ALLUVIUM
Water Rights Well: Management Unit:
Other Well Name: Casing Top Elevation:1210.51 I
Casing Type:PVC, SCH. 80 Casing Diameter (in.):2.0
Screen Type:PVC, SCH. 80, 0.01 IN. SLOT Screen Length (ft.):10.0
Total Casing and Screen (ft.):22.0 Casing Stick-up (ft.):2.50
Well Maintenance Date:

Geophysical Information

Spontaneous Potential: Single Point Resistivity:
Natural Gamma: Extra:

SCREEN INTERVAL 19.5 FEET TO 9.5 FEET BELOW LAND SURFACE; FILTER PACK (MEDIUM QUARTZ SAND) FROM 20 FEET TO 7 FEET BELOW LAND SURFACE; BENTONITE GROUT FROM 7 FEET TO 2.5 FEET BELOW LAND SURFACE; CEMENT GROUT FROM 2.5 FEET BELOW LAND SURFACE TO LAND SURFACE; LOCKING STEEL WELL PROTECTOR INSTALLED.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1208.01 - 1200.01	0.0 - 8.0	TOPSOIL, BLACK, SILTY
1200.01 - 1196.01	8.0 - 12.0	CLAY, GRAY, SILTY
1196.01 - 1188.01	12.0 - 20.0	SAND AND GRAVEL, FINE SAND TO MEDIUM GRAVEL

* * * *

Location Information

Legal Location:NE SE NE SE SEC. 29, T. 093 N., R. 50 W.
County:UNION Location:093N-50W-29DADA
Basin:BIG SIOUX Latitude:42 50' 34"
Hydrologic Unit Code:10170203 Longitude: 96 46' 00"
Land Owner: Ground Surface Elevation (ft.):1248.33 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:07/29/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-16 Total Drill Hole Depth (ft.):262.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 262 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1248.33 - 1246.33	0.0 - 2.0	TOPSOIL, BLACK
1246.33 - 1226.33	2.0 - 22.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1226.33 - 1122.33	22.0 - 126.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1122.33 - 1078.33	126.0 - 170.0	SAND, FINE TO COARSE
1078.33 - 1033.33	170.0 - 215.0	SAND AND GRAVEL, FINE SAND TO FINE PEBBLE GRAVEL
1033.33 - 986.33	215.0 - 262.0	GRAVEL, FINE; INTERBEDDED LAYERS OF FINE TO COARSE SAND

* * * *

Location Information

Legal Location:NE SE NE SE SEC. 29, T. 093 N., R. 50 W.
County:UNION Location:093N-50W-29DADA 1
Basin:BIG SIOUX Latitude:42 50' 34"
Hydrologic Unit Code:10170203 Longitude: 96 46' 00"
Land Owner: Ground Surface Elevation (ft.):1248.33 I

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/12/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-23 Total Drill Hole Depth (ft.):153.0
Samples:

Well Information

SDGS Well Name: R2-2008-23 Aquifer:LOWER-VERMILLION-MISSOURI
Water Rights Well: Management Unit:
Other Well Name: Casing Top Elevation:1250.33 I
Casing Type:PVC, SCH. 80 Casing Diameter (in.):2.0
Screen Type:PVC, SCH. 80, 0.01 IN. SLOT Screen Length (ft.):10.0
Total Casing and Screen (ft.):141.5 Casing Stick-up (ft.):2.00
Well Maintenance Date:

Geophysical Information

Spontaneous Potential: Single Point Resistivity:
Natural Gamma: Extra:

SCREEN INTERVAL FROM 139.5 FEET TO 129.5 FEET BELOW LAND SURFACE; FILTER PACK
(MEDIUM QUARTZ SAND) FROM 139.5 TO 100 FEET BELOW LAND SURFACE; BENTONITE GROUT FROM
100 FEET TO 4 FEET BELOW LAND SURFACE; CEMENT GROUT FROM 4 FEET BELOW LAND SURFACE
TO LAND SURFACE; LOCKING STEEL WELL PROTECTOR INSTALLED.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1248.33 - 1245.33	0.0 - 3.0	TOPSOIL, BLACK
1245.33 - 1222.33	3.0 - 26.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1222.33 - 1121.33	26.0 - 127.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1121.33 - 1095.33	127.0 - 153.0	SAND AND GRAVEL, COARSE SAND TO MEDIUM GRAVEL

* * * *

Location Information

Legal Location:SE SE SW NE SEC. 34, T. 093 N., R. 50 W.
County:UNION Location:093N-50W-34ACDD
Basin:BIG SIOUX Latitude:42 49' 46"
Hydrologic Unit Code:10170203 Longitude: 96 43' 56"
Land Owner: Ground Surface Elevation (ft.):1227 T

Project Information

Project:STATEWIDE MONITORING Geologist:M. NOONAN
Drill Date:08/19/2008 Geologist's Log:X
Company:SDGS Driller:S. JENSEN
Drilling Method:ROTARY Driller's Log:
Test Hole Number:R2-2008-27 Total Drill Hole Depth (ft.):102.0
Samples:

Geophysical Information

Spontaneous Potential:X Single Point Resistivity:X
Natural Gamma:X Extra:

TEST HOLE PLUGGED WITH BENTONITE GROUT FROM 102 FEET TO 5 FEET BELOW LAND SURFACE,
CEMENT GROUT FROM 5 FEET BELOW LAND SURFACE TO LAND SURFACE.

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1227.00 - 1223.00	0.0 - 4.0	TOPSOIL, BLACK
1223.00 - 1210.00	4.0 - 17.0	CLAY, TAN, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1210.00 - 1155.00	17.0 - 72.0	CLAY, GRAY, SILTY, SANDY, PEBBLY, CHALKY (TILL)
1155.00 - 1140.00	72.0 - 87.0	SHALE, GRAY (CARLILE SHALE)
1140.00 - 1125.00	87.0 - 102.0	LIMESTONE, GRAY; INTERBEDDED LAYERS OF BROWN CLAY (GREENHORN LIMESTONE)

* * * *